Anna E. Logan,
216 E. 9th St.,
Cincinnati, O.

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THE OHIO STATE UNIVERSITY

COLLEGE OF EDUCATION

GEORGE F. ARPS, *Dean*

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Educational Research Bulletin

THE FUNCTION OF THE DEPARTMENT OF STATISTICS AND RESEARCH IN THE PUBLIC-RELATIONS PROGRAM

L. C. BAIN
Cleveland Public Schools

"CONFIDENCE of the public" is a phrase that probably can be used as a synonym for both good reputation and good will. A school system that continues to serve satisfactorily its community must build, through a series of contacts with the supporting public, a confidence similar to that which constitutes the good reputation of the individual and the good will of the business organization. Such faith in the public-school system cannot be brought about by an advertising campaign. It is a more significant and permanent thing than can be created by intensive or spasmodic publicity; in fact, such methods tend to destroy the confidence in the school that has been established previously.

SUITABLE MATERIAL FOR THE PUBLIC-RELATIONS PROGRAM

A good public-relations program supplies the public, throughout the year, with information for instilling confidence in the school system. This material is of two kinds: (1) human-interest stories found in the school, at work, and at play, which will reveal the effectiveness of the school as an educational and social institution; and (2) informational data which will present the significant facts on enrollment, organization, achievement, housing, revenues, and expenditures.

In both types of material it is as well to admit the weaknesses of the system as to emphasize the outstanding merits, for the school is a human institution and, therefore, not perfect. Education is ever in a state of experimentation and transition; mistakes are inevitable. The people may justly be suspicious that all is not right if only commendable and favorable conditions in the schools are brought to their attention.

The outstanding school administrator needs and seeks the aid of the community in correcting and improving conditions in his school. This is particularly true if increased expenditures are involved, for there are those in every community who regard any increase in expenditures as a "weakness" in the system. Increased expenditures backed by the confidence of a majority of the public are likely to cause but little embarrassment. On the other hand, increased expenditures resulting from a school program which has not been "sold" to the supporting public may prove disastrous and react against the administration and against a progressive school program for the community.

The fact that the administrator is a professional man of integrity and ability, technically trained for the work of administering a school system, may qualify him to be a dictator in

the matter of a school program for the community he serves; but expediency and worth-while results over a period of years assign him to a more desirable rôle in a democracy, that of a leader. Every successful leader must have the confidence of his followers. There need be no apology then for that type of publicity which establishes confidence in the public-school system.

AGENCIES FOR PROMOTING THE PUBLIC-RELATIONS PROGRAM

Several agencies aid in giving the public-relations program desirable and effective publicity. These include publications, civic and school organizations, exhibits, and radio programs. Daily newspapers, school papers, house organs, and annual reports of the school system are publications which promote the program for better public relations. School papers are of two kinds: those for the school system published by an editorial board representing the board of education, the superintendent's staff, the principals, and the teachers; and those for the pupils published by the individual schools—senior high, junior high, and elementary. Some of the house organs of local industrial and business firms will accept articles on education in general or on some specific phase of the school system if they are not written as propaganda, but news. Organizations, such as chambers of commerce, parent-teacher associations, women's clubs, and teachers' federations serve as aids in furthering a program of good will toward the school system. Public exhibitions and "open nights" for parents should reveal the school at work. Radio talks on pertinent subjects and radio programs furnished by school talent help to promote better public relations as do the visiting teachers and alumni associations.

HOW THE DEPARTMENT OF STATISTICS AND RESEARCH MAY FUNCTION

The writer feels that the Department of Statistics and Research can best serve indirectly in public relations; and if content to help in this manner, its services can be made significantly valuable. This position is defensible because those whose chief function it is to deal directly with the public, should know accurately the technique of public contacts, while the chief business of the Department of Statistics and Research should be to know which facts are significant and pertinent in an ever-widening supply of source material and to have a technique for gathering such facts and organizing them for effective presentation. This implies that the one in charge of the Department of Statistics and Research should take the initiative in selecting and organizing material for the public-relations program.

The Department of Statistics and Research is responsible for supplying appropriate subject-matter in a concise and understandable form to those persons who more properly and more effectively deal directly with the various agencies. In most school systems this should be interpreted to mean that the superintendent of schools, or someone definitely appointed to the task by him, should represent the schools in the contacts made with outside organizations.

The Department should be ready to furnish at all times accurate and well-organized data on such subjects as: (1) population of the school district; (2) population of legal school age within the district; (3) the enrollment in public and parochial schools by age, grade, activity, and districts; (4) data upon which a thoroughly sound building program may be based; (5) budget procedure; (6) revenues, including

analyses of local tax levies; (7) current expenditures; (8) debt service; (9) per pupil expenditure for each item of expenditure for each of the activities maintained in the school; (10) teachers' salaries, salary schedules, teaching load. These are merely headings under which the information may be grouped. Some of these items are merely routine for a Department of Statistics and Research. However, even in the matter of routine procedure, much may be done to select school items of significance to the public. All information should be kept on a continuous basis so comparisons may be made from year to year. The plan of keeping the records is such that information can be furnished which will be valuable in the future, as well as it is in the present.

The value of ready references.—Requests for such items of information as present enrollment, changes in enrollment, number of teachers, pupils per teacher, current expenditures, and per-pupil expenditures are frequently made by the press, various committees, and civic organizations. The administrator who supplies this information immediately creates a favorable impression upon the agencies making the request. By anticipating such requests the Department of Statistics and Research renders a real service to the administration and the school.

When the financial and cost accounting of a business organization is thoroughly done and the other records are adequate to meet promptly the needs for pertinent and reliable information, confidence is created in the organization. If these same conditions are found to exist in a school system, they aid materially in establishing the same degree of confidence in its management and the service it renders.

Forestalling criticism.—Occasionally facts relative to the organization of the schools, if found out and first made public by outsiders, place the administration in a defensive position. This is unfortunate because explanations under such circumstances, no matter how logical or pertinent, may be interpreted as an apology or alibi. It is perhaps much better that such facts, together with their explanations, first be made public by the administrator. For instance, the number of pupils per teacher might be reduced because of improved housing conditions or an increase in the number of elective subjects offered in a comparatively small high school. If the reasons for the reduction are first made public by the superintendent, then the critics' attack is transferred from the average number of pupils per teacher to the improved housing conditions or the increase in elective subjects offered. "Too many teachers" sounds bad, but "improved housing conditions" or "more elective subjects" sounds good to most patrons of the school.

One of the functions of a Department of Statistics and Research is to discover items of this nature and bring them to the attention of the superintendent at once. The superintendent's annual report offers one means of making public such information.

Conducting research for building programs.—One of the most valuable services which a Department of Statistics and Research can render in a growing city is that of conducting a continuous survey on which a sound building program may be based. A survey must include considerable data, such as the following:

1. A study of the growth and shifts in population—past, present, and probable; this should be done by school districts and such combinations of

districts as industrial, social, economic, and geographical conditions warrant.

2. Complete data on present school-housing conditions; overcrowding portables, basement rooms, undesirable rooms, vacant rooms, shift and relay classes.
3. The type of buildings being erected, or likely to be erected, in various sections of the city, such as factories, business blocks, warehouses, and residences—single, duplex, or apartment.
4. Children per family in public schools for each type of community.
5. Information relative to the extent of the education and building programs of the religious denominations which furnish all or a part of the educational advantages to their members.
6. Any available information which can be secured from public-utility companies relative to extensions of their service and their population estimates for various sections of the city.
7. Plans of the city for street and sewer improvements and extensions of water mains.
8. Probable additions and annexations to the present school district.
9. Records and plans of the city planning and zoning commission and the restrictions of the building code.

TABLE I

ANALYSIS OF CURRENT EXPENDITURES, CLEVELAND PUBLIC SCHOOLS DURING THE SCHOOL YEAR 1926–27

Expense Item	Amount		Percent
(1)	(2)		(3)
Tuition Payroll:*			
Teachers	$10,220,425.59		62
Principals and assistants	823,098.74		5
Supervisors headquarters	170,712.50		1
Auxiliary agencies and coordinate activities	312,519.68		2
General control	173,977.39		1
Total tuition payroll		$11,700,733.90	71
Non-Tuition Payroll:			
Custodians and helpers	1,076,814.99		7
Maintenance labor paid by Board of Education	354,000.00		2
Instruction, auxiliary agencies and coordinate activities	324,341.88		2
General control	395,899.02		2
Total non-tuition payroll		2,151,055.89	13
Total payroll for school year		$13,851,789.79	84
Supplies and Miscellaneous:			
Operation	717,004.26		5
Instruction†	381,895.02		2
All other functions	201,905.34		1
Total supplies and miscellaneous		1,300,804.62	8
Maintenance:			
Contracts and material purchased direct by Board of Education		955,455.53‡	6
Fixed charges, refunds, and unclassified items		372,147.13	2
Total all non-payroll items		2,628,407.28	16
Total current expenditures		$16,480,197.07	100

*The tuition payroll covers the salaries of all those who must hold teachers certificates as a legal requirement for employment.

†Free textbooks and supplementary reading included.

‡Expenditures for improvement included in this amount.

10. A record of sites which would be desirable for public schools, the extent to which they are improved, and the probable cost of each.
11. Pin maps showing the distribution of the school population in districts about which critical issues or controversies may center.

Any plans for building should depend on the kind of school program to be afforded. Much better results are secured if the program which is to be carried out in the building is first determined and the building planned to meet the needs of such a program.

A building program which is based on a continuous survey of the eleven factors cited here merits the confidence and support of the public. The administration is then in a position to answer on a factual basis the objections to any part of a building program backed by such data and research. Furthermore, such a plan furnishes much pertinent information which can be used to advantage in presenting to the public the needs for a bond issue or a building-fund levy.

Current expenditures.—In dealing with the public, the superintendent needs complete analyses of the current expenditures. The Department of Statistics and Research should provide him with this information in order that he may be able to give it to the public without delay. These analyses should show such information as: expenditures for any activity or function, distribution of current expenditures by amounts and percents, and per-pupil expenditures for any item and any activity. Summary sheets illustrating different points of view should be compiled. Graphs frequently aid in presenting the data resulting from the different analyses.

The summary given in Table I was made to show the percent of the total current expenditures allotted directly by the Cleveland Board of Education for the salaries and wages of the various employees in all departments.[1] This summary shows that 71 percent of the total current expenditures were paid to those on the tuition payroll and 13 percent to those on other payrolls. Thus, it is seen that 84 percent of the total current expenditures were paid direct to employees of the Board of Education.[2]

TABLE II

COMPARISON OF PER-PUPIL CURRENT EXPENDITURES IN VARIOUS ACTIVITIES, CLEVELAND PUBLIC SCHOOLS DURING THE YEAR 1926–27

Divisions of the School System	Per-Pupil Current Expenditures	Ratio to Per-Pupil Expenditures in Regular Classes Grades I to VI*
(1)	(2)	(3)
Regular classes (Grades I–VI)	$ 92	1.00 : 1.00 (Base)
Kindergarten	73	.79 : 1.00
Junior high	122	1.33 : 1.00
Senior high	169	1.84 : 1.00
Blind and Sight-Saving Classes:		
Elementary	449	4.88 : 1.00
Junior high	378	4.11 : 1.00
Special Elementary Classes:		
Mentally defective	206	2.24 : 1.00
Open air	155	1.68 : 1.00
Over-age	152	1.65 : 1.00
Borderline	126	1.37 : 1.00
Pre-primary	119	1.29 : 1.00
Gifted	153	1.67 : 1.00
Special Schools:		
Alexander Graham Bell (deaf children)	430	4.67 : 1.00
Sunbeam (crippled children)	518	5.62 : 1.00
Thomas A. Edison (boys)	148	1.61 : 1.00
Sibley (girls)	235	2.55 : 1.00

*See Figure 1.

Data on comparative expenditures.—The superintendent needs at least

[1] Data resulting from this summary will be used again to compare the increase in current expenditures with the increase in wages in the trades and the increase in the average income of all persons gainfully employed.

[2] Some maintenance and improvement work is done by contract, wages for which are not included in these figures for wages and salaries.

one kind, and in most cities two kinds, of comparative expenditure data: one comparing expenditures for various activities in the local system and probably another comparing local expenditures with those in neighboring districts. These should be prepared by the Department of Statistics and Research. Such data should compare the present year with previous years and, at budget time, with the estimate for the coming year. A

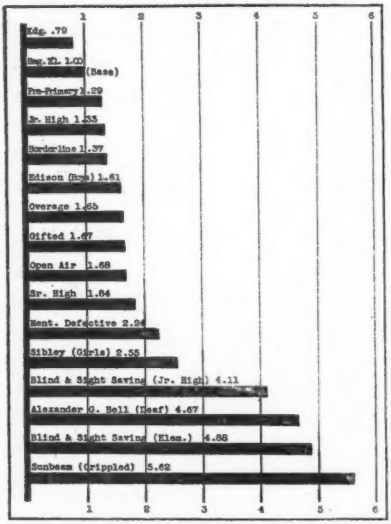

Figure 1. Comparison of per-pupil current expenditures for various day-school activities in the Cleveland public schools during the school year 1926-27

comparison of the per-pupil expenditures in the various divisions of the school should also be shown.

The comparison of the per-pupil expenditures for the various divisions or activities can be made quite simple by expressing such items for each activity as a multiple of, or ratio to, the per-pupil expenditure for the regular classes, Grades I to VI. Such a table for the schools of Cleveland, during the school year 1926-27, is given in Table II. Figure 1 gives the graphic comparison of per-pupil expenditures for the various day-school activities.

The need for a second kind of comparison of expenditures grows out of the fact that probably in every community there are those who attempt to measure the efficiency of the local school system by comparing its expenditures with those of some other city, chosen because of its size, its location, or a notion that its expenditures are exceptionally low. Such comparisons are usually the result of a most superficial study of the facts: those who have gone into such matters thoroughly find that in any two school systems there is more to contrast than to compare. Because such superficial comparisons will continue to be made it is almost necessary, as a defense measure, that someone on the superintendent's staff shall make a detailed study of the organization, educational program, and accounting system of one or more school systems most likely to be used in such comparisons. The preparation of such studies should be considered a function of the Department of Statistics and Research.

Such comparisons cannot be made by the questionnaire method. Only a detailed analysis of source materials such as enrollment statements, budgets and payrolls, will suffice to make the comparisons accurate: housing conditions must be investigated. The accounting methods used by the two schools must be studied and inventories made of the activities financed by each of the two systems. Activities paid for out of the school funds in some cities are paid for out of the city funds in other cities.

The school officials of City A were recently charged by its critics with

spending six million dollars a year more than was necessary to support a school system equivalent to that of City B which was considered excellent. Six million dollars of the taxpayers' money in City A was alleged to be wasted annually. However, the critics' comparison of expenditures was based wholly on the school budgets of the two systems.

The two cities have entirely different plans of financing the functions of the local governments, and several large items which are budgeted and paid as school expenditures in City A are budgeted and paid as expenditures of the government in City B. The most significant differences are tabulated in Table III. These facts alone were quite enough to discredit the statements of critics. It was easily shown that the total school budgets of the two cities are not comparable amounts, because they do not cover the same items of public expenditures. Another difference, not shown in the table, is the extent to which the junior high-school program is in effect. Both cities are pledged to such a program, and City A has less than 15 percent of its seventh- and eighth-grade enrollments housed in elementary buildings, while City B has approximately 50 percent of its seventh and eighth graders so housed.

Any significant comparison of two school systems must take into account the extent to which the atypical children are given an educational program to meet their special needs; also, the percents of the total enrollment found in the kindergarten and junior and senior high schools. Another item which should be studied carefully is the adequacy of the housing facilities. These are factors which must be considered in comparing the expenditures of any two school systems.

The comparison of the expenditures in two cities has been discussed at some considerable length to emphasize the hazards of superficially made comparisons, regardless of who makes them or with what motives they are made. Such comparisons cannot be used as a sound basis for conclusions or action because the half-

TABLE III

COMPARISON OF THE ITEMS

ITEMS	BUDGETED AND PAID AS SCHOOL EXPENDITURES IN CITY A AND CITY B	
	City A	City B
(1)	(2)	(3)
Debt service on all school bonds	Yes*	No
Health work in schools	Yes	No
Dental clinics in schools	Yes	No
Community centers	Yes	No
Light and power for schools	Yes	No
Handling of school funds	Yes	No
City colleges other than normal school	No	Yes
Public playgrounds	50	None
Teachers retirement fund	$335,000	$25,000 (Estimate)
Improvements to existing buildings	Wholly	Partly

* This item for City A amounted to $3,110,000.

truths cover up the real facts in the situation: furthermore, their use may cause serious embarrassment and a loss of confidence to the administration of either school.

(To be continued)

A MAJOR PROBLEM

EVERY good citizen—particularly every citizen who has children to educate—occasionally does some serious thinking about the schools. Often there is a suspicion that these schools are not so good as they might be, and sometimes certain notions are advanced as to how to make them better.

In all such considerations, however, there are two fallacies which continually creep in and warp our thinking. The first of these arises from the fact that the average parent thinks of the school in terms of the school which he or she attended years ago. Too often we fail to realize that education like everything else changes as time passes. Twenty-five years ago, few of us had automobiles, and none of us dreamed of airships or radios. Now all three are quite common. The quarter of a century just past has been a period of prodigious change in every walk of life, and the school has had to change too.

The second fallacy which often falsifies our thinking is a feeling that all men are created equal. In some senses this is true, but it is quite wrong to infer that all children are equally gifted. Still the idea of equality is wide spread among our people. They read of it in the Declaration of Independence and the Gettysburg address, and some give to it an interpretation which is far different from that which was originally intended. When our forefathers spoke of the equality of man, they meant equality in life, liberty, and the pursuit of happiness. When they spoke of all men as created equal they meant men—they were not thinking of women or children. Indeed, they did not really mean all men, for Negroes and Indians were excluded.

In modern times, however, there is a tendency to give to the equality of man a much larger interpretation. Now when Mary or Tom fail to learn as they should, their parents often tell the teacher that Mary could learn if she was not so frivolous and Tom is a bright boy, but oh, so lazy. When the teacher is gone, it is not unusual to hear a different explanation—both of the children could learn if they had a good teacher. In other words, all children are created equal, and all of them could learn equally well if they had good teachers and applied themselves properly.

Well, there are frivolous girls and lazy boys; and there are incompetent teachers. But over and above all stands the indisputable fact that some children are smarter—more intelligent—than others.

In the old days this problem was not so acute. Slow and dull pupils came to school, but they did not remain long. Some of them scarcely came at all. The school was for the brighter pupil; for him the work was often deliberately made difficult. If a pupil could not keep up, he was rather encouraged to drop out and go to work. Schools of the old days vied among each other on the high standards that were maintained.

Some schools went so far as to make a specialty of training leaders. The writer attended a college of this sort once. In that college there was a mathematics professor who was called "Uncle Dick" and whose reputation had gone far and wide.

It was noised abroad that Uncle Dick's pupils were always successful in life. This rumor came to the writer, who in his freshman innocence said, "I shall go and take Uncle Dick's mathematics, and I too shall succeed in life." At the appointed time the Freshman went; but, alas, within a week it was all quite plain. Uncle Dick's pupils did succeed after graduation if they ever graduated. Those who could survive him could survive anything.

Yet the sort of training which was given in that class was not so badly adapted to the pupils who attended that college. Education then was a series of hurdles, and Uncle Dick's business was to set the hurdle. He did his duty and did it well.

That was twenty-five years ago. Since then a far-reaching change has taken place. The old schools did their work well, and their graduates have given excellent account of themselves. They have sold education to the public. The common man now believes that education is the key to success. He wants all his children to get possession of this key. He passes laws which compel all children to attend school, and he expects a product equal to that turned out by the schools of twenty-five years ago when the teacher could keep her better pupils and get rid of the poorer ones. Now she must keep them all—the bright and the dull, the talented and the mediocre—and must seek to get all of them over the hurdles which constitute education. Manifestly, the task is impossible; and consequently a new conception of the school is emerging. According to the new conception the school is no longer to be an institution which sets up hurdles in the form of examinations to be passed or failed, but now it is to be an institution set up and maintained by society to minister to the educational needs of all the children. Its purpose is to help each child to do better whatever worth-while thing he can do, no matter how lowly or simple that thing shall be.

Our people are getting tired of paying taxes to support a school which flunks their children. They feel that every child who attends school and makes an honest effort is entitled to some credit. Some go so far as to say that every pupil who does his best with whatever brains he possesses should receive a mark of 100 percent.

Because of this the subject-matter of our courses of study is being made easier, and the number of failures is shrinking to zero. This leads to the present dilemma which constitutes what the speaker considers the greatest educational problem of present times. How can we maintain our old rigorous standards and yet minister to the educational needs of all the children? This problem touches every school in the land from the universities down. It is a serious one and the solution is not yet clear. One thing, however, is certain, old methods of school-keeping must change. We can no longer think of giving the same assignment to all the pupils in the class, neither should we expect all of them to use precisely the same textbook. Finally, we shall have to make up our minds to spend more money on the education of our children. This is a disagreeable thought, but we must get used to it.

We cannot educate all kinds of children at the same expense for which we educated the gifted children of twenty-five years ago.

The problem of coordinating the seemingly contradictory elements in this situation is one that challenges the best minds engaged in the business

(*Continued on page 334*)

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W. W. CHARTERS - - - - *Editor*
JOSEPHINE MACLATCHY - *Assistant Editor*

Address all communications to the
BUREAU OF EDUCATIONAL RESEARCH
Ohio State University, Columbus, Ohio

FADS

WIDE-SPREAD national interest in educational ideas has a span of three or four years. An examination of the proceedings of national and state societies shows that the project method was at the height of its popularity as a subject of discussion from 1917 to 1920. Curriculum construction was the most popular subject from 1924 to 1927, and just now character education seems to be approaching the center of the stage.

The critic is mildly or vigorously derisive of these fluctuations. He refers to them as "fads" and is amused or irritated by the seeming lack of consistent interest among school people. The thoughtful observer, however, sees that fads such as these have their uses as well as their limitations and that when properly safeguarded, they confer permanent benefits on the schools.

The value of the fad lies in the fact that it gives wide publicity to a good idea which heretofore has been neglected. The project method contains two valuable theories: school situations should as far as possible correspond to life situations, and purposeful activity is superior to the performance of formal tasks. Recent interest in the curriculum is based on the universal feeling that courses of study need to be validated or reorganized in the interest of maximum efficiency. The growing interest in character education arises from a recognition of the coordinate value of character and information and of the necessity for subordinating information to behavior. Service is undoubtedly rendered to education when national thought is given to these matters.

The limitations of fads are those associated with exuberance of interest. Teachers may have strong enthusiasms without grasping the central idea of the words they hear on everybody's lips; an activity may be called a project whether it is rightfully one or not. Also, the educators sponsoring the new device may not have worked out the methods which lead to the efficient development of the central idea. The value of curriculum reorganization may be talked about and little may be done because no one knows how to reorganize the course of study. Soon the interest dies, the school processes run on much as before.

The maximum amount of good is derived from faddishness when the friends of the exploited idea meet the occasion with energy and industry. The level of the efficiency of teaching is permanently raised when this interest is sustained and satisfied by the elaboration of adequate methods. Wide-spread interest in the project method raises permanently the level of teaching when experts in that field provide teachers generously, and speedily, with the techniques needed to arrange projects and to teach by the project method. Interest in the curriculum is maintained when the constructors of the curriculum furnish teachers with methods of procuring the kinds of curricula which are advocated, and enthusiasm for char-

acter education is adequately capitalized when the character-builders present, at the psychological moment, the materials and methods necessary to develop character.

When enthusiasms are thus supported by those who can provide intelligent methods each national surge of interest raises teaching to a higher level. If this support is not provided, the movements of the fads degenerate into wavelike fluctuations when every crest of interest is followed by a trough of indifference or derision.

W. W. C.

THE COST OF QUICK SHIFTING IN NUMBER LEARNING[1]

GARRY C. MYERS
AND
CAROLINE C. MYERS
Cleveland School of Education

A COMMON method of teaching arithmetic is to present mixed examples in such order that the pupil must shift rapidly from one process to another in giving his answers. For example, he may have to add, multiply, subtract, divide, subtract, multiply, and divide in rapid succession. Some texts require the pupil to practice on a given exercise of mixed examples until he answers them within a prescribed time. Practically all such oral and written examples are in forms of drill exercises.

Almost every teacher has observed the difficulty with which the pupils solve such groups of examples. She has also observed that frequently the pupil in his formal work in arithmetic adds when he should subtract, subtracts when he should add, or manifests all sorts of confusion among the four fundamental processes.

This study attempts to inquire into the nature and frequency of errors in solving one hundred simple combinations so mixed that the pupils must shift rapidly and almost constantly among the four fundamental processes.

[1]Read by Garry C. Myers before the American Association for the Advancement of Science, Philadelphia, December 28, 1927.

With this were compared the nature and frequency of errors in working the one hundred combinations rearranged in groups according to the process involved.

Twenty-five combinations in addition, in multiplication, in subtraction, and in division were grouped on one side of the test sheet. On the other side of the test sheet the same one hundred combinations were printed in mixed arrangement.

The first five grouped combinations of each column and the first five mixed combinations were:

GROUPED

$1+8=$	$7\times7=$	$13-6=$	$6\div2=$
$7+2=$	$4\times9=$	$9-4=$	$18\div3=$
$0+4=$	$6\times5=$	$7-7=$	$45\div5=$
$6+9=$	$0\times4=$	$6-0=$	$64\div8=$
$5+4=$	$8\times3=$	$14-8=$	$9\div3=$

MIXED

$1+8=$	$9\div3=$	$9-4=$	$6\times4=$
$7+1=$	$5+2=$	$4\times9=$	$7+2=$
$2\times0=$	$8\times4=$	$6+0=$	$63\div9=$
$14-5=$	$10-9=$	$7\times5=$	$54\div6=$
$7-7=$	$13-5=$	$14\div2=$	$12-7=$

In this investigation, individual study was made of 164 pupils—fifty pupils in the fifth grade; sixty-four, in the sixth grade; and fifty girls in the normal school. They were selected

at random. The first pupil of a given group was tested with the grouped combinations followed by the mixed combinations; the next pupil was tested with the mixed examples first and then with the grouped examples; the third pupil began with the grouped examples and so on, alternating throughout the group. The experimenters made sure that each child, before he was tested, knew the meaning of each of the signs. The pupil gave his answers orally while the experimenter recorded each answer in full and noted the total time needed for performance on the grouped and mixed combinations, respectively.

In Table I are given several average measures—time in seconds, the total errors, the errors within a given process, the errors of wrong process, and the number of changed answers. If, for example, a pupil obviously added wrongly where the sign indicated addition, when his answer would not have been correct had he used another process; for example, if he answered "16" to 9+ 6, his answer was considered an error within the process. If, on the other hand, he obviously added when the sign called for multiplication—if he answered "12" to 9 × 3—his answer was considered an error of wrong process. We see that it took noticeably more time, and the errors and number of answers changed were greater, for the mixed than for the grouped combinations.

Table II shows the superiority of the work on the grouped examples in terms of percent. One reads the table thus: The normal-school girls, on the average, took 30 percent more time to give verbally the answers to the one hundred combinations when they were mixed, than they took to do the same one hundred combinations when they were grouped. These girls made 106 percent more total errors, 47 percent more errors within the process, 570 percent more errors of process, and 198 percent more changes in their answers, in solving the grouped examples. The inferiority of the mixed problems in terms of time and errors was more pronounced for the fifth- and sixth-grade children than for those in the normal school. For all these groups the

TABLE I

AVERAGE PERFORMANCE ON MIXED AND GROUPED COMBINATIONS

Combinations	Time in Seconds	Errors within Process	Errors of Wrong Process	Total Errors	Changed Answers
(1)	(2)	(3)	(4)	(5)	(6)
	Normal-School Students (50)				
Mixed....	158	6	4	10	3
Grouped..	122	4	1	5	1
	Sixth-Grade Pupils (64)				
Mixed....	346	6	8	13	3
Grouped..	230	4	2	6	2
	Fifth-Grade Pupils (50)				
Mixed....	444	5	7	13	4
Grouped..	312	3	1	5	1

errors were largely limited to errors of process. A pupil added when he should have multiplied, subtracted when he should have added, divided when he should have subtracted, or confused the signs in all sorts of ways.

About 50 percent more errors were made within a process when the problems were mixed than when they were grouped. Clearly there was a carry-over of an error-making tendency.

In general it took almost one and one-half times as long to give the answers on the hundred mixed combinations as on the same one hundred

examples when they were grouped according to each process and more than twice as many errors were made. One may interpret these measures of difference as fairly true measures of the time and errors which the total shifting among the processes caused.

One marked difference between the two types of performance was not measurable. An emotional annoyance was generally manifested by each pupil when he was answering examples on the mixed page. With some pupils this annoyance was shown by gestures of the face, hands, legs, and frequently the entire body. When the grouped examples were given first, only 9 had such confusions. The respective figures for the 50 fifth-grade children were 16 and 9.

These data clearly show the greater amount of confusion caused by work with the mixed combinations and the transfer of this confusion to work with grouped combinations. Said in another way, rapid shifting by the pupil from one process to another not only causes great confusion of processes, but the pupil so confused also tends to be more confused when he later works on combinations grouped twenty-five to a process.

TABLE II

AVERAGE PERCENTS BY WHICH THE RECORDS ON THE MIXED EXERCISES EXCEEDED THOSE ON THE GROUPED EXERCISES

	Time in Seconds	Errors within Process	Errors of Wrong Process	Total Errors	Changed Answers
(1)	(2)	(3)	(4)	(5)	(6)
Normal-school girls...	30	47	570	106	198
Sixth-grade pupils.....	50	48	359	140	96
Fifth-grade pupils.....	42	56	549	179	181

Exclamations—"I'm dumb" and "What's the matter with me!"—were characteristic reactions. No such expressions were heard and no gestures expressive of annoyance were observed during the solution of the grouped combinations.

ERRORS DUE TO CONFUSION OF SIGNS

Of the 64 sixth-grade pupils, 26 confused the process in one or more grouped combinations and 63 in the mixed combinations. More confusion occurred with the grouped examples when they were given after the mixed examples. When the mixed combinations were given first, 17 of the 64 children had one or more confusions of process with the grouped examples.

In making all these comparisons, the nine combinations including zeros were not counted since there was no certain way of ascertaining just what process was used. If we were to count them as they appear, the effect of confusion would prove still greater.

One would expect all confusions, when the grouped examples were solved first, to be limited to the beginning of the second, third, and fourth columns where the symbols called for shifting to another process. Only 3 of the 9 fifth-grade and 2 of the 9 sixth-grade confusions were such. The remaining total of 13 confusions must have come about for other reasons—transfers, no doubt, from the frequent classroom practice of demand for such shifting. The

writers attempted to discover what effect the sign immediately preceding the sign confused had upon the confusion when confusions of process occurred in answering mixed examples. Sixty-nine percent of the confusion by the sixth-grade pupils was in cases in which the wrong process used was that indicated by the sign of the combination immediately preceding it. For example, "14" was answered to $7 + 2 = ?$ when just above that combination appeared $6 \times 4 = ?$ There were 41 divisions by the sixth-graders when the sign called for subtraction and 48 by the fifth-graders. Seventy-seven subtractions were made by the sixth-graders when the sign called for division and 27 by the fifth-graders.

The facts are given in Table III. From this table one reads that of the sixteen hundred possible correct responses to the sign of addition, 161 sixth-grade pupils responded to it as if it were multiplication; 21, as if it were subtraction; and 2, as if it were division. On the average, 1 out of 12 answers by this grade were errors of signs. In the fifth grade, the average was 1 out of 14. About one child out of 10 multiplied when he should have added, and more than 1 out of 9 added when he should have multiplied. The greatest confusion was between addition and multiplication, and the second greatest was between subtraction and division. Relatively little confusion existed between any other pair of signs. These facts agreed with the teachers' judgments.

TABLE III

CORRECT AND INCORRECT RESPONSES TO MIXED COMBINATIONS

SIGNS USED IN THE TEST	RESPONSE GIVEN				PERCENT OF ERRORS
	Addition	Multiplication	Subtraction	Division	
(1)	(2)	(3)	(4)	(5)	(6)
	Sixth-Grade Pupils (64)				
Addition	1,416	161	21	2	12
Multiplication	138	1,434	20	8	10
Subtraction	19	8	1,532	41	4
Division	2	19	77	1,502	6
	Fifth-Grade Pupils (50)				
Addition	1,117	114	18	1	11
Multiplication	97	1,135	10	8	9
Subtraction	11	3	1,188	48	5
Division	2	21	27	1,200	4

Signs most frequently confused.—It is interesting to note what signs are most frequently confused. The sixth-grade children used the multiplication process in 161 cases when the sign called for addition and the addition process in 138 cases when the sign called for multiplication. For the fifth-grade children the respective figures were 114 and 97.

Just why should multiplication and addition signs be so often confused; and why subtraction and division? Perhaps the reason lay in their similarity in appearance. In two previous experimental studies, it was found that these items of learning which differed in meaning but were obviously much alike in form were most readily confused.[1] It may be assumed that not one of the 164 pupils added when he was trying to subtract, for example, or confused at any time any of the processes per se. What happened was that the wrong processes were set off by the sign which was immediately exposed. The pupil who multiplied in response to $7 + 2$ actually saw 7×2. In other words, he failed to see what he looked at.

Scientific studies of perception have demonstrated that we see only a small portion of the words, phrases, and other symbols which we interpret. Just because these simple signs of the fundamental processes easily may be confused and because they set off mental processes, it is necessary that they be seen quite in detail. Therefore, the teacher's task is to guide the child to observe them cautiously. On the contrary, the average teacher and textbook in arithmetic have been training the child to try to perceive these signs in the shortest time.

A good rule for avoiding confusion is to keep apart those items of learning which are most likely to be confused, and to center attention upon each one alone in enough situations to make its mastery certain. Once confusion has developed, put the emphasis in learning upon only one of the confused items, and, for the time, wholly ignore the other items. The child confusing addition and multiplication signs should be exercised upon either the use of addition alone for a number of days or upon multiplication alone as the teacher sees fit. After each has been learned, occasional short exercises given without suggestion of speed but calling for discrimination may be of value.

[1] Myers, Garry C. "Confusion in Recall," *Journal of Educational Psychology*, 8:166-75, March, 1917; "Delayed Recall in History," *Journal of Educational Psychology*, 8:275-83, May, 1917.

ERRORS DUE TO THE EFFECT OF TRANSFER

It will be remembered that one-half of the pupils answered the grouped examples first and one-half the mixed examples. Table IV shows what may be expected from transfer effect. For each group of pupils tested, the time required to answer the mixed examples when they were given first was greater than the time required when they were answered second. The difference was in reverse order on the grouped examples, for the time required to answer them when given first was consistently shorter than when they were given

TABLE IV

PERFORMANCES ON MIXED AND GROUPED COMBINATIONS WHEN GIVEN ALTERNATINGLY FIRST AND SECOND

COMBINATIONS	TIME IN SECONDS		ERRORS	
	Given First	Given Second	Given First	Given Second
(1)	(2)	(3)	(4)	(5)
	Normal-School Students (25)			
Mixed....	4,041	3,851	236	255
Grouped..	2,909	3,165	137	101
	Sixth-Grade Pupils (32)			
Mixed....	11,562	10,558	443	415
Grouped..	7,334	7,385	169	188
	Fifth-Grade Pupils (25)			
Mixed....	11,186	11,028	323	313
Grouped..	7,379	8,221	108	120

second. The same relative differences obtained for errors for the fifth and sixth grades, but not for the normal-school girls. The mixed exercises seemed to make the normal-school girls more cautious in the grouped exercises which followed. The ease with which they answered the grouped exercise first also seemed to make them less cautious in solving mixed exercises.

Some of the facts shown by this study have more import for elementary-school children. We find that the one practice on the grouped combinations makes performance on the mixed combinations faster and more accurate. But, the one practice on the latter makes performance on the grouped exercise slower and less accurate. Grouped practice, or practice with a single given process, promotes efficiency in later performances when there is shifting from one process to another, while practice when there is shifting among processes hinders later performances where there is no shifting of processes.

EFFECT OF PRACTICE

The writers wished to determine whether the time and error differences between performances with grouped combinations and mixed combinations were merely differences found by a single trial or differences which continued with practice. Ten sixth-grade children were given the combinations on each page five successive times at one sitting with a pause of about two minutes between each performance. Five began with the grouped page and five with the mixed page. Results are given in Table V.

Obviously, the gain due to practice on the mixed numbers is a little greater than on the grouped examples. Nevertheless, as was pointed out in Table IV, working with the grouped exercise helps to increase speed and accuracy on the mixed exercise, while working on the mixed exercise reduces speed and accuracy on the grouped exercise. Hence, the records for the mixed and grouped exercises tend to become more alike with practice.

After four practices it takes the same pupil, on the average, 26 percent more time to do the one hundred combinations mixed than it took to do them grouped on the first trial. He also makes 136 percent more errors after the fourth practice.

TABLE V

COMPARISON OF AVERAGE TIME AND ERRORS WITH PRACTICE ON MIXED AND GROUPED EXAMPLES

TRIAL	AVERAGE TIME		AVERAGE ERRORS	
	Grouped Examples	Mixed Examples	Grouped Examples	Mixed Examples
(1)	(2)	(3)	(4)	(5)
First	221	294	4	10
Second	224	283	4	8
Third	219	270	3	7
Fourth	210	260	3	8
Fifth	210	264	3	6
Average	217	274	3	8

These practice data offer nothing in favor of quick shifting, but much against it.

It is much easier then to add when one has a mental set for adding, to multiply when one has a mental set for multiplying, and so on, than to shift rapidly from one process to another. The mental gears do not always shift when they are supposed to shift.

This study does not show, of course, what would happen if pupils from the beginning of their number work, took plenty of time and felt no urge to hasten. Groups of pupils so trained over a period of several years are hardly to be found anywhere, however. Neither does this

study tell us what would happen if only two processes, say addition and subtraction, were involved. This study, however, does demonstrate conclusively that rapid random shifting from one to another among the four fundamental processes is the cause of a large number of errors and the loss of considerable time.

Granted that these mixed exercises were harder than the grouped ones, someone may argue that they had value just because of their difficulty, that they called for more alertness by the pupil. If this difficulty were expressed only in greater time for solution, the argument would seem to bear weight. But, this loss was also in accuracy—loss where signs were properly interpreted and loss by way of confusion—and this loss was appalling. Why confound the learner by where doing so we also increase his general tendency to make mistakes? If someone wishes to give exercises for alertness let him choose as material activities which will not make school work more difficult.

Any method which greatly increases errors is of doubtful value. Investigations have demonstrated that errors tend strongly to persist and that emphasis upon accuracy in mechanical learning furthers speed eventually; while emphasis upon speed tends to reduce both speed and accuracy.[1]

Others maintain that a child must learn in life to shift from one fundamental process to another. There is in life, however, practically no situation in which one must shift from one situation to another in response to such symbols as +, ÷, ×, and −. Whatever shifting there may be is in response to a real situation. In that event there is no likelihood that the process will be confused. Have you ever observed a person at home, on the street, in the factory, or in the market, divide when he should subtract or multiply when he should add? Have you ever seen the preschool child manifest such confusion in his play with numbers?

Some may argue that we must shift processes in long division. Very true, but in long division we do not respond to a group of symbols. Instead, we learn by experience a different sequence. We divide, multiply, and subtract, and always in that order. We are not called upon to shift with the speed which is usually necessary in the type of mixed exercises used in this investigation.

How many pupils shall we expect to answer to the one hundred combinations without errors? Not one of the 144 fifth-grade or sixth-grade pupils, and not one of the 50 normal-school girls made an errorless record on the mixed examples. Only 5 normal-school girls, 4 fifth-grade, and 5 sixth-grade pupils did so on the grouped examples, about one out of 12. To the combinations $0 + 4$, $6 + 0$, $0 + 1$, and $0 + 5$, 8, 1, 41, and 4 normal-school girls, respectively, answered "0." The respective "0" answers by the fifth-grade pupils were 11, 3, 5, and 3. The combinations $6 - 0$, $8 - 0$, and $2 - 0$, were answered "0," respectively, by 2, 6, and 3 normal-school girls and 7, 8, and 8 fifth-graders. To 0×4 an answer of "0" was given by 28 normal-school girls and 44 fifth-grade pupils, and 2×0 was given as "0" by 27 normal-school girls and by 46 fifth-graders. Twenty-three normal-school girls gave the answer "0" to $7 \div 7$ and 6 gave 49, while "0" was answered by 10 fifth-graders and "49" by 6 of them. Twenty normal-school girls answered "0" to $9 \div 9$,

[1] Myers, Garry C. "Persistence of Errors in Arithmetic," *Journal of Educational Research*, 10:19-28, June, 1924; Myers, Garry C., Spett, Augusta, and Broom, Margaret, "Speed Versus Accuracy in Learning," *School and Society*, 8:687-90, December 7, 1918.

five of them answered "81." Seven fifth-graders answered "0" to 9 ÷ 9, while 6 answered "81."

IMMEDIATE CORRECTION OF ERRORS

As any teacher knows, a child answering verbally often corrects a wrong answer in the same breath immediately after giving the wrong answer. How often does this happen? When an attempt at correction is made how often is it right?

The responses by the fifth- and sixth-grade pupils to the mixed page were studied in order to answer these questions. One or more changes were made in their answers by 91 percent of the sixth-grade children and 78 percent of them were correct. Of the changes made by 90 percent of the fifth-grade children 95 percent were correct.

Of all the errors made by the sixth-grade pupils, 15 percent were changed and 14 percent, correctly. Of all the errors changed, 94 percent were changed correctly. Thirty percent of the errors made by the fifth grade were changed and 29 percent of those changed were correct. Of all the errors changed, 97 percent were changed correctly.

These facts present practical problems in learning and teaching. Why does the pupil correct his own mistakes after he has given verbal expression to them rather than before? He does so because he is in the habit of doing so. He spends a good deal of his time in class exercising this habit. Why does he not recognize his error and correct it immediately before he says it? He does not have time to do so. As a rule, the classroom atmosphere induces him to make answers quickly and to use all the time he needs thereafter for correcting them.

From the foregoing data one finds that almost one mistake out of four never would have occurred had the pupil corrected himself mentally instead of correcting himself verbally. What a saving of time and annoyance there would be if the pupil could be trained in such mental correction of mistakes. In order to effect such training the usual speed pressure must be removed; the stop watch must be abandoned. Emphasis must be put upon accuracy. Those errors which were not detected and corrected by the pupil could also greatly be reduced by removing speed and by effectual emphasis upon accuracy.

This study certainly condemns those verbal and written exercises of such form as the following, especially when speed is suggested by remarks or time limits:

$8 \times 3 =$	$15 - 7 =$
$9 + 7 =$	$3 \times 8 =$
$11 - 2 =$	$7 + 9 =$
$16 \div 8 =$	$10 \div 5 =$

These findings seem also to condemn such an exercise as

$$8 + 6 \div 7 \times 9 - 3 = .$$

If we were to substitute the criteria of calm, carefulness, and accuracy for excitement, carelessness, and speed in the classroom, we might be able to teach the children to evaluate and correct the associations that flash to their minds in response to a specific problem before they give expression to them. They should be taught to criticize them mentally and to correct their answers before making them.

A MAJOR PROBLEM

(*Continued from page 325*)

of education today. A solution of some kind will surely be found.

In the meantime, taxpayers should not be surprised if the teachers ask for more money to buy practice material and supplementary books.

The practice materials for the slow pupil who needs more help than his textbook gives. The supplementary readers and other books are for the bright children who need more than the ordinary textbook contains. In such ways as these, educators are striving to solve this serious problem that has arisen in our attempt to educate properly all the children of all the people.

W. J. OSBURN

EDUCATIONAL READINGS

MCANDREW, WILLIAM. *The Best of Binghamton, ER*, 76:91–96, September, 1928.

This entertaining, interesting article describes the school activities of Binghamton, New York. At Binghamton the children are taught how to play. All the children play and the class teacher plays with them. Play is a logical outcome of Binghamton's remarkable health program which includes not only routine health inspection, but service to the school child and to the community. The schoolhouses are health centers for instruction to mothers in the feeding and care of babies. Another promising feature of this system is the "school adjuster" who investigates complaints which are received by the superintendent.

MYERS, ALONZO F. *The Course in Observation and Participation in Its Relationship to Courses in Principles of Teaching, Methods, School Management, etc., EAS*, 14:404–12, September, 1928.

The relationship of professional courses in education to the course in observation and participation as given at Ohio University was criticized by students through answers to a questionnaire. Experienced, as well as inexperienced, teachers reported the desirability of the course in observation and participation, especially if it precedes or parallels the professional courses. The author calls attention to the tendency of instructors to lean too heavily upon this course instead of planning their own observation lessons which illustrate specific methods or techniques. He also feels a need of keeping the teachers of educational courses definitely familiar with what is being shown in the observation and participation course.

KEAL, HARRY M. *Mental Ratings, Scholarship and Health, S&S*, 28:277–80, September 1, 1928.

When expected correlations between the group rating, scholarship, and tenure of Freshmen in Cass Technical High School, Detroit, failed to materialize, Mr. Keal attempted to ascertain the causes. For the study, 107 students, selected at random from IX–B English classes, were grouped into high, medium, and low groups. It was found after four years that 48 percent of the high group, 17 percent of the medium group, and 33 percent of the low group remained in school. Corrective work on physical defects, given only to the low group after the first year, is suggested as the chief cause for less mortality in that group when compared with the middle group. Later, corrective work given to all the students materially altered the ratings and seemed in the author's opinion to bear out the contention that "health is the greatest single factor governing school success."

BODE, B. H. *Where Does One Go for Fundamental Assumptions in Education? EAS*, 14:361–70, September, 1928.

FREEMAN, FRANK N. *Psychology as the Source of Fundamental Assumptions in Education, EAS*, 14:371–77, September, 1928.

REISNER, EDWARD H. *The History of Education as a Source of Fundamental Assumptions in Education, EAS*, 14:378–84, September, 1928.

PETERS, CHARLES C. *Educational Sociology as a Source of Fundamental Assumptions in Education, EAS*, 14:385–92, September, 1928.

These four papers were read at the Boston meeting of the Department of Superintendence under the general heading, "Sources of Fundamental Assumptions in Education." Dr. Bode says we are overstocked with assumptions in education. "Our problem is to get away from assumptions, particularly those which are claimed to have the indorsement of science. Or, more accurately, if we wish to use assumptions as tools for interpretation and not

NOTE.—The abbreviations used in this issue are: *ER*, Educational Review; *EAS*, Educational Administration and Supervision; *S&S*, School and Society; *JER*, Journal of Educational Research; *E*, Elleusis; and *JGP*, Journal of Genetic Psychology.

as final, uncriticized dogmas, then we must go to philosophy of education, where assumptions can be scrutinized in the light of one another and of all the available facts." According to Dr. Freeman, "When we get to the bottom of the matter we find that all fundamental assumptions are psychological in nature." Dr. Reisner feels that a historical point of view is necessary for a proper consideration of what are fundamental assumptions. Dr. Peters states, "There are very few fundamental assumptions that education needs to make and we do not go to educational sociology or to any other university study for them." The four articles taken together give the reader an understanding of the contributions which each of these fields of education has to make.

OBRIEN, F. P. *Mental Ability with Reference to Selection and Retention of College Students*, *JER*, 18:136–43, September, 1928.

More than four thousand Kansas students were given the Terman Group Test of Mental Ability in the junior or senior year of high school. As large a number of these as possible were traced through high-school graduation and college attendance. Among the significant findings is the fact that 35 percent of the high-school graduates entered college, but that fewer than half of the high-school graduates who ranked above average in mental ability went to college. Further, 42 percent of those eliminated from college ranked in mental ability above the average of all who entered. His final conclusion is striking: "It appears from the facts at hand that the colleges are really successful neither in attracting nor holding the mentally fit."

GAW, ESTHER ALLEN, AND CLOUSING, JOSEPHINE. *An Objective Study of Students' Personality Traits*, *E*, 30:107–18, May, 1928.

An interesting approach to the guidance of college women is made in this study of the likes and dislikes of 525 freshmen women at Ohio State University. In the fall of 1927 these students expressed the degrees of approval or disapproval which they felt toward actions of women in 162 specified instances. Habits of personal cleanliness and neatness occurred most often in the list of highly approved items, while situations most distinctly disapproved involved slovenliness of person or dress. Roughly, four types of attitude were found; namely, easy-going, and not discriminating, 15 percent; definitely conventional, 46 percent; extremely conservative, 11 percent; and "different" in approving things which the majority disapproved and vice versa, 28 percent.

HUBBARD, RUTH M. *A Measurement of Mechanical Interests*, *JGP*, 35:229–52, June, 1928.

The study deals with the interests of junior high-school boys. It is based on the construction of an objective-interest analysis. Correlations were determined between shop ability, as objectively indicated, and attitudes to certain items as recorded on the blank. Interests do contribute to the prediction of mechanical success as measured by shop ability, when they are combined with suitable mechanical tests. They add something to the value of the prediction possible on the basis of the tests alone. No significant differences are evident among groups of boys, whether selected by grade, by age, or by school, in the interest analysis designed to measure mechanical interests. The lack of difference in mechanical interests between academic and vocational high-school boys is paralelled by a significantly poorer score in mechanical ability for vocational-school boys than for the academic-school boys of the same age.

IN PAPER COVERS

BOWNOCKER, J. A., AND STOUT, W. *Mineral Industries of Ohio Based on Materials Native to the State*. Columbus, Ohio, State of Ohio, 1928. 94 pp. and map. (Geological Survey of Ohio, Fourth Series, Bulletin 33)

Teachers of geography in Ohio schools should find this bulletin helpful in presenting facts about the mineral industries within the State. The bulletin consists of two parts; a large map of the State showing the location of the mineral industries, and a list of the companies engaged in the industry with their location and products.

VAUGHN, JAMES. *Positive vs. Negative Instruction*. New York, National Bureau of Casualty and Surety Underwriters, 1928. 168 pp. (Educational Series, Vol. II)

Mr. Vaughn has made an experimental study in which electro-mechanical apparatus was used to ascertain the result of different types of instruction upon the behavior of children and adults who ranged from the primary grades to graduate work in the University of Chicago. Six experiments were conducted, each involving both positive and negative instructions.

The general results, as listed by the author, were as follows: verbal instructions unsupported by other forms of stimulation are relatively ineffective, especially with children; the effect of warnings and threats are transient, especially with children; demonstrations of the manner in which injury may take place have more effect on behavior than mere positive or negative direction; actual experience of the ill effects of wrong reactions is most effective; and drastic threats or punishment may occasionally inhibit desired behavior.

SCRIPTURE, ELIZABETH, AND GREER, MARGARET R. *Find It Yourself!* New York, H. W. Wilson Company, 1927. Teacher's Edition. 62 pp.

By following this "brief course in the use of libraries under the contract system" the student becomes familiar with his school library through the fulfillment of seven so-called "blocks." Each block is further divided into four contracts, A, B, C, and D. The D and C contracts are designed for the average student while the B and A are more advanced. Reading and observation of books and library materials comprise the D contract. In contract C the student compiles a bibliography on a single subject in which he is interested. Contract B calls for the answering of appropriate questions by means of library tools. Creative work in which the student uses his experience to make a library tool, such as an index, a table of contents, or an article for an encyclopedia, comprises contract A. The plan as outlined allows the librarian to do her routine work and help the contract students at the same time. It also allows each student to work individually at tasks suited to his capacity.

BOOKS TO READ

WEILL, BLANCHE C. *The Behavior of Young Children of the Same Family.* Cambridge, Massachusetts, Harvard University Press, 1928. (Harvard Studies in Education, Vol. 10)

This study presents an analysis of the records of seventeen families with fifty-nine children, twenty-five of whom were problem children brought to the Massachusetts Habit Clinics. The author attempts to solve the question regarding the causes of behavior difficulties of some children whose brothers and sisters may not be problem children. It is frequently assumed that children in the same family have the same environment, but the author's careful and intensive study leads her to the conclusion that the environments of each individual member of the family are different, and that these differences are the chief causes of the behavior difficulties.

HULL, CLARK L. *Aptitude Testing.* Yonkers-on-Hudson, World Book Company, 1928. xvi + 535 pp.

This subject is dealt with from two standpoints—principles and methods. It includes discussions of scholastic, vocational, temperamental, sensory and motor, and other types of tests. The discussion of the technique of test construction includes a training in constructing test batteries, in choosing test material, and in correctly interpreting the data. The book deals with the modern trend in testing, that is, the testing of special aptitudes, and it presents a scientific study of just what factors are involved in all types of mental measurement.

This work should be exceedingly helpful to all who make a serious use of measurement methods in classification and in guidance. It is suitable for those engaged in aptitude testing, whether vocational guidance, general personnel work, or employment selection.

STARBUCK, E. D., AND OTHERS. *Fairy Tale, Myth, and Legend.* New York, Macmillan Company, 1928. xiii + 389 pp. (Vol. I, A Guide to Literature for Character Training)

This book and subsequent companion volumes are the outcome of the so-called "Iowa plan of character education" which would develop the moral attitudes of children by the indirect or natural method rather than by the direct or didactic method. The plan assumes that the choicest reading materials, placed where children will find them, will be enjoyed spontaneously and will quicken the finer impulses.

The scope and significance of the fairy tale, the methods of evaluating literature, the art of story-telling, and the use of the entire series are discussed in Part I. In Part II is given an annotated list of all recommended books and stories, grouped according to grade and arranged in order of merit. In Part III are presented the same titles given under the heads of the moral situations to which they apply. Helpful reference material and the always essential indexes are found in the last two sections of the book. Since there is much indiscriminate writing for children, a guide such as this should be helpful to parents, story-tellers, teachers, and librarians.

JORDAN, RIVERDA HARDING. *Extra-Classroom Activities in Elementary and Secondary Schools.* New York, Thomas Y. Crowell Company, 1928. ix + 302 pp.

Many books on extra-curricular activities have been published during recent years and the reader of a new book on this subject wonders whether he is reading "just another book." Unlike most of its predecessors, this book keeps in mind the unity of the extra-curricular activities from the elementary school through the senior high school. Extra-curricular activities are discussed as to their values, financing, direction and control, and the extent of participation in them. Each chapter is concluded by a list of problems and questions. A well-selected, though unannotated, bibliography is included. The Appendix reproduces the constitutions of representative, worth-while school organizations. The book is written in a clear and interesting style.

ODELL, C. W. *Traditional Examinations and New-Type Tests.* The Century Company, 1928. xvii + 462 pp.

In this volume two chapters are devoted to a discussion of school marks, their meaning, and distribution. The remainder of the book deals with the two general types of examinations which are designanated as traditional and new-type. The author states that the work is a collection of the best material in the field in a single, unified treatment, rather than to any considerable extent an original contribution. On the basis of this criterion the author has well achieved his purpose. In Chapter VII the merits and limitations of traditional and new-type examinations are clearly presented, and the author concludes that the traditional type should not be entirely discarded in favor of the new-type tests. Teachers both in service and training should find this volume of considerable help in getting a prospectus of the fields covered.

NEW TESTS

The Hill-Wilson Civic Action Test has been developed for the purpose of determining the degree of civic cooperation of students in Grades VI to XII, inclusive. The items were selected: (1) on the basis of actual civic experience of adults, (2) from a study of recent textbooks in social science, (3) on the judgment of research leaders in the field of social studies, (4) on the judgment of teachers, and (5) from experiments with many pupils. Medians are based on twelve hundred cases. The reviewer is inclined to question the practical value of the tests. The test is published by the Public School Publishing Company.

Pressey's Diagnostic Tests in the Fundamental Reading Habits, by Luella C. Pressey, are designed to measure three of what the author terms the four bad habits of eye-movements, the amount of vocalization in silent reading, and the ability to read syllables in unfamiliar words. Each of the three booklets—one for Grade II, one for Grades III and IV, and one for Grades V and VI—contains four selections. A book of directions and a score card are included in the material. Norms are given for the five elements measured, but no statement is made as to how they were compiled. No data on reliability or validity are given. These tests are published by the Public School Publishing Company.

A test on Classical References and Allusions has been devised by B. L. Ullman of the University of Chicago and Grace W. Clark; it is distributed by the Bureau of Educational Research and Service at the University of Iowa. The test is based on the classical allusions found in current newspapers and magazines and in the reading assigned to students of high-school English. It may be used by teachers of Latin, English, or history.

The test comprises fifty subtests of the multiple-choice type. The norms for students who have studied Latin two, four, six, and eight semesters are given for the grades from eight through twelve, while medians for the students in these grades who have never studied Latin are also included.